

# Leibniz and Monads

The Human Situation

Team Omega, Spring 2010

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# Overview

- Leibniz's Life
- The Rise of Modernism
  - *Monadology* 1-30
  - All about Monads

# Leibniz 1646-1716

The Duchess of Orleans said of him:

“It's so rare for intellectuals to be smartly dressed, and not to smell, and to understand jokes.”



## A contemporary description of Leibniz

*“Leibniz was a man of medium height with a stoop, broad-shouldered but bandy-legged, as capable of thinking for several days sitting in the same chair as of travelling the roads of Europe summer and winter. He was an indefatigable worker, a universal letter writer (he had more than 600 correspondents), a patriot and cosmopolitan, a great scientist, and one of the most powerful spirits of Western civilisation.”*

# Gottfried Wilhelm von Leibniz

“A walking encyclopedia” – King George I

*Monadology, 1714*

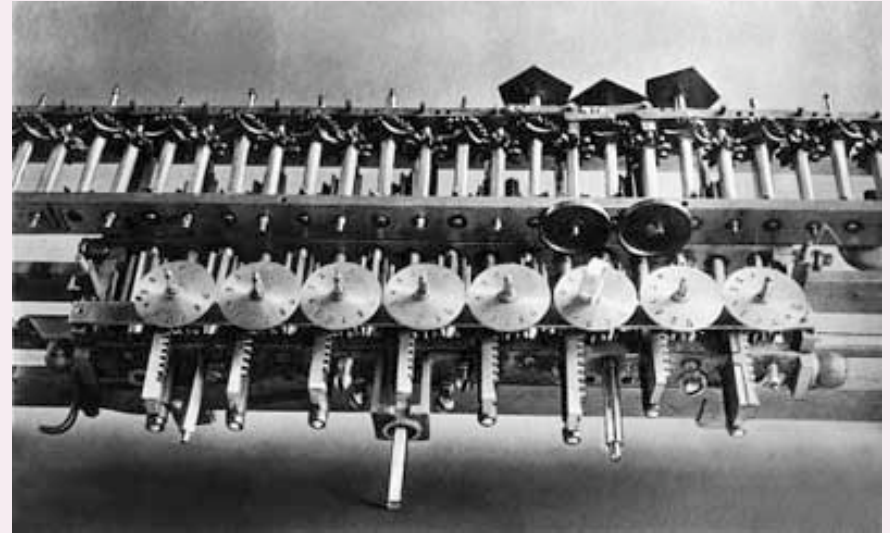
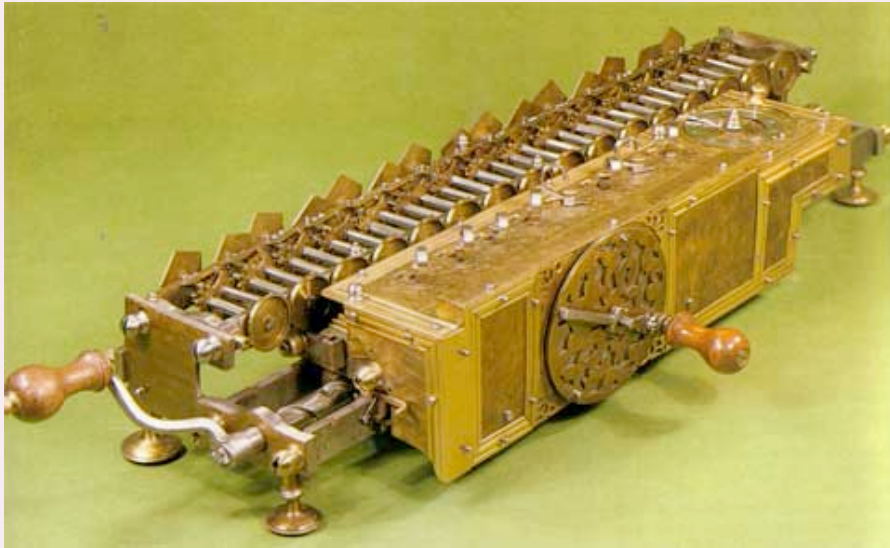


# Leibniz the Polymath

- Studies in university: Law, philosophy, Latin, Greek
- Independent: algebra, mathematics, physics, dynamics, optics, tried to create a submarine
- Secretary of Nuremberg Alchemical Society
- Laws of motion, gravity, mechanics, dynamics, topology, geology, linguistics
- Politics, international affairs, economics, coinage, watches, lamps
- Traveled to Paris, London, Vienna, Italy, etc.
- Invented Infinitesimal calculus, created a notation for it

$$d(x^n) = nx^{n-1}dx$$

# Leibniz's Calculating Machine



# Leibniz and the Prince

- 1676-1716, Librarian to the Duke of Hanover
- Privy councilor to successive members of the House of Brunswick of Hanover, and friend/correspondent/teacher of successive prominent women in the family
- Librarian and family historian
- Invented wind and water power for mining





# Princess Caroline of Brandenburg-Ansbach (1683-1737)



Married in 1705 to Georg August (1683-1760),  
Electoral Prince of Hanover,  
King George I of England

Queen Consort of England and  
Ireland (1727-1737)

Grandmother of King George III  
of England (1760-1820)

Friend and Pupil of Leibniz

# The Rediscovery of the Ancients

- Pythagoreanism: mathematical explanations
- **Atomism: materialism, determinism**
- **Skepticism: resistance to all dogmas**
- **Aristotle's biology: vitalism, teleology**

# Breakup of Scholasticism

## Rise of Science

- Copernicus 1473 -1543 Astronomy
- Galileo 1564 - 1642 Astronomy
- Gassendi 1592 - 1655 Atomism, mechanism
- Boyle 1627 - 1691 Physics, chemistry, volume of gas, vacuum
- Newton 1643 - 1727 Mechanics, gravity, calculus, corpuscular theory of light
- Huygens 1629 - 1695 Astronomy, telescopes, pendulum clocks, wave theory of light

# Early modern philosophy

- **Francis Bacon**                      **1561-1626**
- **Hobbes**                                **1588-1679**
- **Descartes**                            **1596 1650**
- **Locke**                                  **1632-1704**

# Introducing Monads

**From Greek “monas, monades”:** unity, unities  
(cp. “monochromatic”, “monosyllable”)

**Two key points to remember (and reconcile...?)**

“The Monads have no windows through which anything may come in or go out.” (7)

**Each monad mirrors the entire universe.**

“Every body responds to all that happens in the universe” (61)

The soul is “the mirror of an indestructible universe” (77; see also 51, 56, 57, 60)

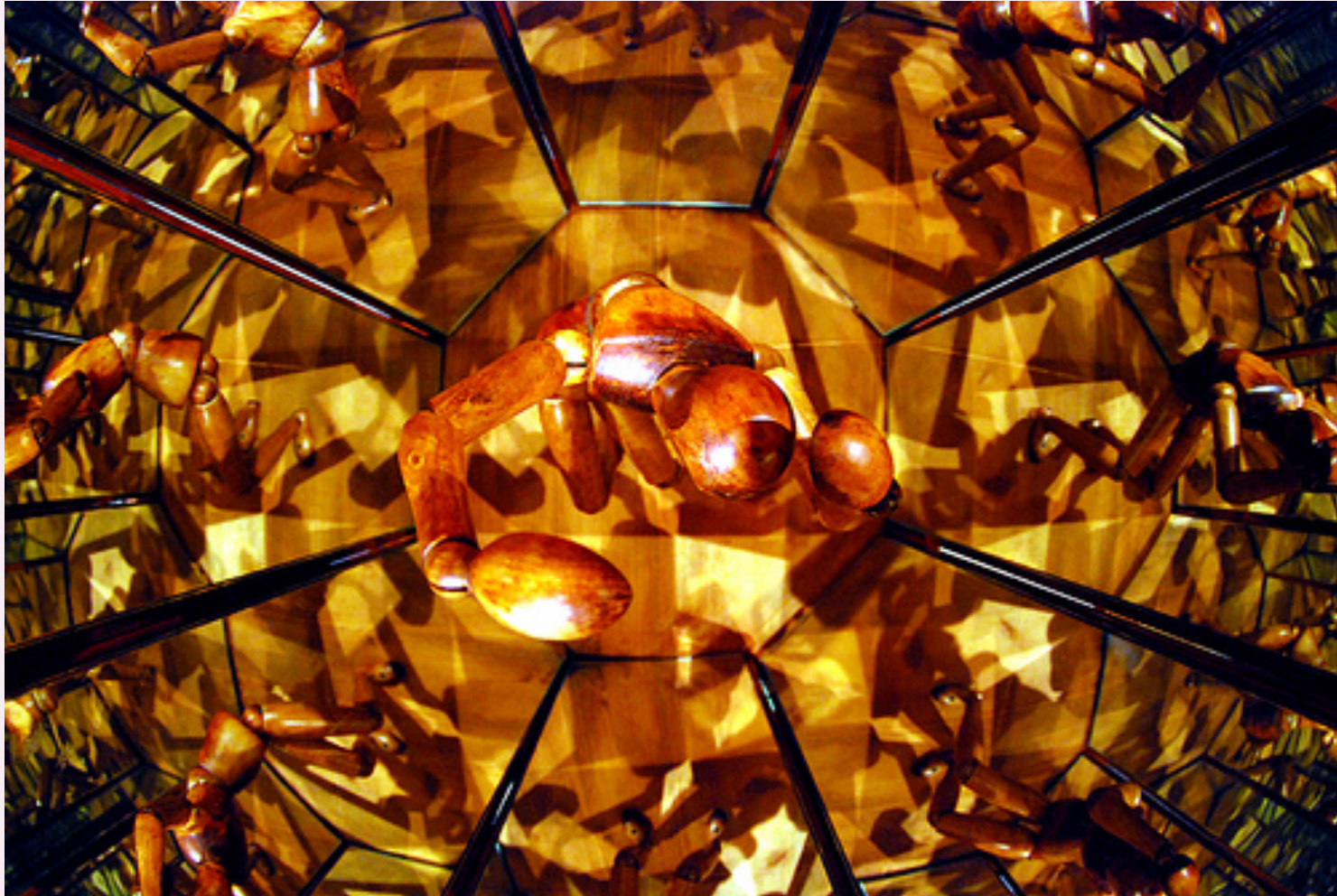
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# Monads: Basic Facts

- **Simple substances: have no parts (1)**
- **Elements of all things, enter into composites**
- **No extension, form, divisibility, (3), or dissolution (4)**
- **Not created by natural means (4)**
- **No change through any other created thing (7)**
- **Unique and distinct (9)**
- **Change, but only from within (11), through appetite (15)**
- **Existence and change involve perceptions (14)**
- **Perceptions inexplicable by mechanical causes (17)**

# Leonardo's Mirror Chamber







# Leibniz's Aristotelianism

Monads are Entelechies (have a perfection or end in themselves) 18

Compare Aristotle's definition of soul in *De Anima* II, 1:

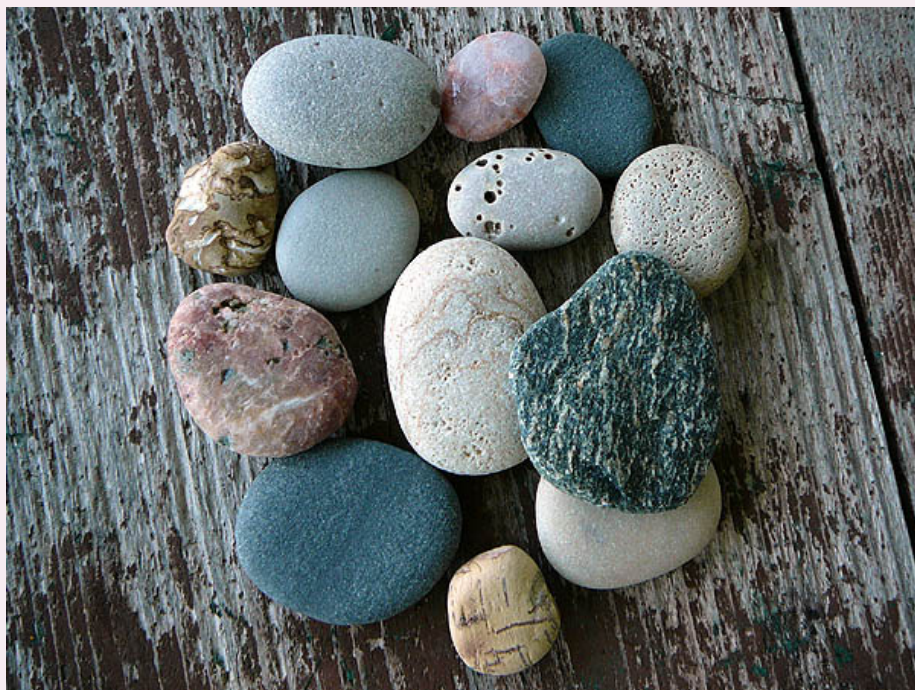
“Soul must be a substance in the sense of the form of a natural body having life potentially in it.”

“Soul is an actuality of the first kind of natural body having life potentially in it.”

# But what is a monad, really?

Are all monads souls?

**Stones**



**Trees and plants**

*See Monadology 19, 24*

# Animals



*Monadology 25*

# Human Beings



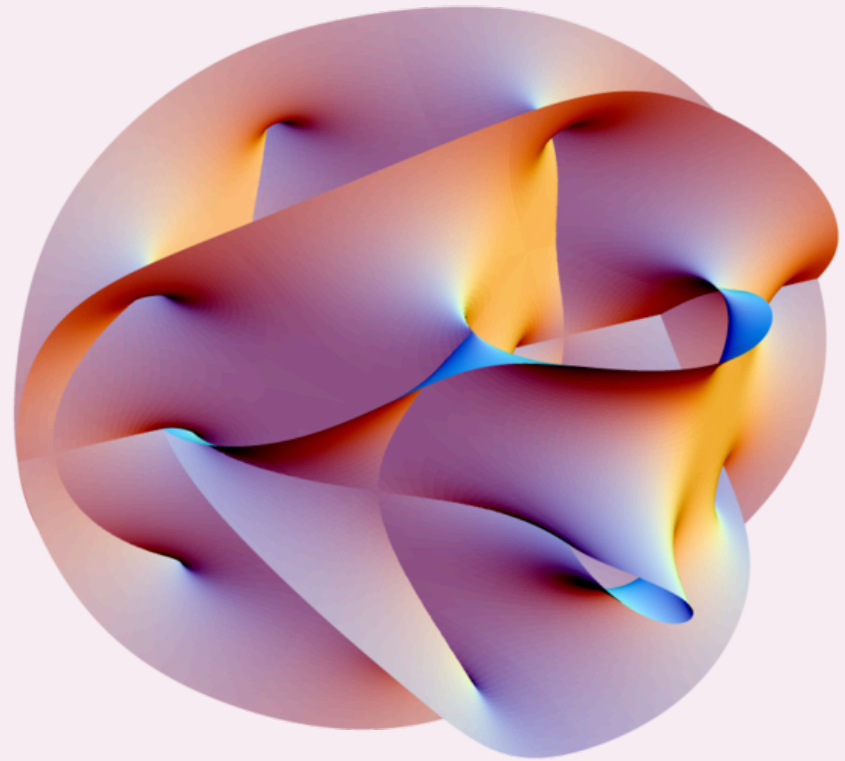
*See Monadology 28, 29*

# Levels of Monads

- Bare Monads: perceptions, “big with the future”, dynamic
- Souls: Monads with heightened perception, sense-organs and memories (animals)
- Rational Souls or Minds:  
Monads with knowledge of eternal and necessary truths, abstraction, reflective acts, and science (humans)

# Are monads so crazy?

“String theory is a theory of gravity, an extension of General Relativity, and the classical interpretation of strings and branes is that they are quantum mechanical vibrating, extended charged black holes.”



# More on String Theory

- The overarching physical insight behind string theory is the holographic principle, which states that the description of the oscillations of the surface of a black hole must also describe the spacetime around it.
- Holography demands that a low-dimensional theory describing the fluctuations of a horizon will end up describing everything that can fall through, which can be anything at all. So a theory of a black hole horizon is a theory of everything.



# String Theory

Levels of magnification:

1. Macroscopic level -  
Matter

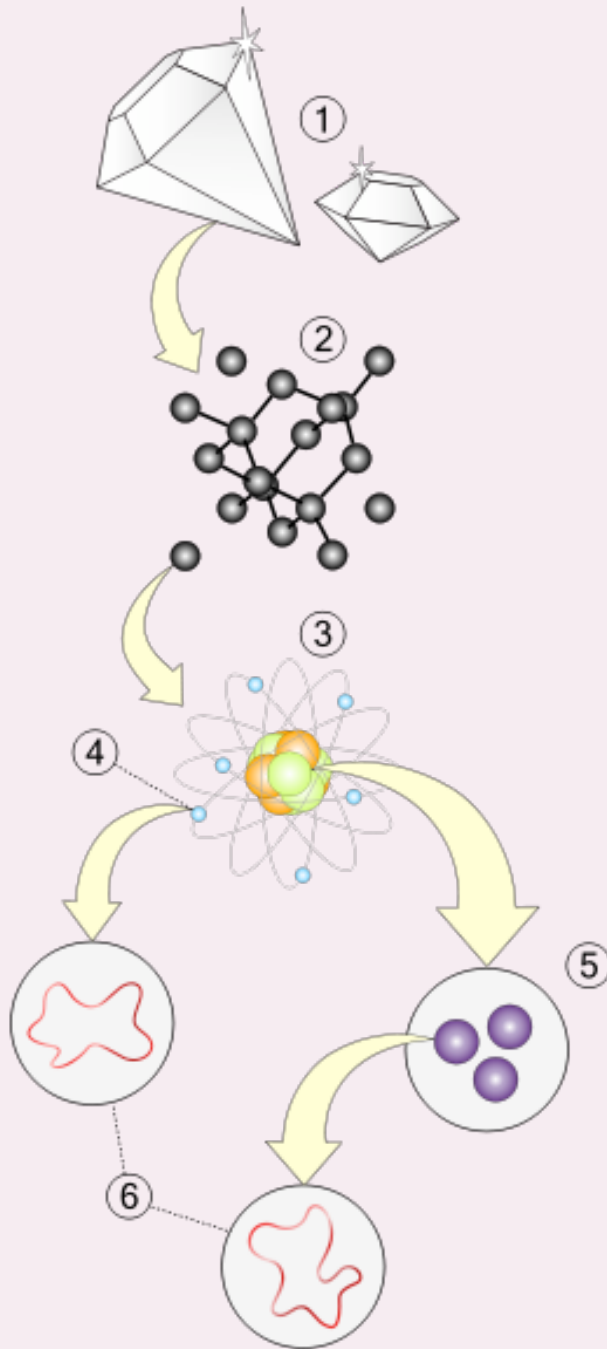
2. Molecular level

3. Atomic level - Protons,  
neutrons, and electrons

4. Subatomic level -  
Electron

5. Subatomic level - Quarks

6. String level



# God and the Best of all Possible Worlds

## **Next Lecture**

*Monadology 31-69*

*Discourse on Metaphysics I-V and XXXIV*



**Josiah McElheney, *Modernity circa 1952, Mirrored and Reflected Infinitely*, 2004  
Milwaukee Museum of Art**